UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Northwest and Alaska Fisheries Center
Kodiak Investigations-Research
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Cruise Results

Cruise No. AK-87-02 Leg I
Research Vessel R/V Alaska

November 1987

On August 10, 1987 the R/V Alaska arrived at Sand Point, Alaska upon completion of a 8 day shellfish resource assessment cruise. The area surveyed included the waters of Pavlof, Volcano and Canoe Bays on the south side of the Alaska Peninsula.

Objectives

1. Delineate the distribution and estimate the relative abundance of pandalid shrimp populations within Pavlof Bay.

2. Collect sexed carapace length frequency data on pandalid shrimp and size information on selected fish species.

3. Collect surface to bottom water temperature data in areas surveyed.

4. Collect shrimp specimens for pathology studies.

Methods

Echo sounding transects were made to determine suitable areas for trawling. A 30-minute tow of approximately one nautical mile in length was then made with the high opening shrimp trawl. This trawl sweeps a path of approximately 9.75 meters (32 feet) and has 32 mm (1.25 inch) mesh size throughout with a 32 mm mesh cod end liner.

The total catch weight was taken using an electronic load cell. The catch was then dumped onto a sorting table and all fish and large invertebrates were removed, sorted by species, enumerated, and weighed. Length frequencies were taken for pacific halibut (*Hippoglossus stenolepis*).

A subsample of the shrimp catch was then sorted by species, enumerated, and weighed. Calculations were made to determine percent composition of the entire shrimp catch. At least 300 specimens were randomly selected or the entire amount was sorted

by sex and measured. Carapace length was measured from the rear of the left eye orbit to the median posterior edge of the carapace. Pink (Pandalus borealis) and coonstripe shrimp (Pandalus hypsinotus) were measured to the nearest 0.01 mm.

At the end of each tow a bucket thermometer was used to determine surface water temperature. An XBT cast was made to record the water temperature profile during each tow.

Results

A total of 12 successful tows were made in trawable locations within randomly selected survey grid squares in Pavlof and Volcano bays (Fig. 1). An exploratory tow was made outside the survey area in Canoe Bay. Table 1 presents starting coordinates, depths, length of tow, and surface and bottom temperatures for each tow. Information on the fish and shrimp catches obtained in each tow is presented in Table 2. Over 3,320 shrimp were sexed and measured for the 1987 size analysis (Fig. 2). Ninety-one pandalid shrimp were collected for histopathological study.

Mean pandalid shrimp abundance in Pavlof Bay showed a decrease over that found in the last annual survey in September 1986. The average catch was 38 lbs per nautical mile this year as compared to nearly 65 lbs in 1986. The biomass estimate of 0.63 million lbs. for pandalid shrimp this year continues to remain well below that of the mid 1970's. The catch from Canoe Bay was excluded from these estimates since it is not part of the standard survey area.

As in the past several surveys fish dominated catches. The percent of fish in catches ranged from 61 to 99% and averaged 93%. Total fish catch weights are given in Table 2 for each tow. Fish catches were dominated by flatfish (mostly yellowfin sole, (Limanda aspera) which comprised over 51% of total fish caught. Together, Pacific cod, (Gadus macrocephalus) and pollock, (Theragara chalcogramma) made up about 45% of total fish caught.

The average count per pound of 105 is lower than reported for the 1986 survey (129 count) and reflects the larger average size of shrimp found this year. The catch of male pink shrimp decreased from 7,628 per nautical mile towed in 1986 to 2,373 per nautical mile towed this year. The number of males caught is below the 1980-1986 average (4,605 per nautical mile) and indicates poorer than average recruitment in 1987.

Scientific Personnel

Paul Anderson	Field Party Chief	NWAFC-Kodiak
Al Sparks	Invertebrate Pathologist	NWAFC-Seattle
Frank Morado	Fisheries Biologist	NWAFC-Seattle
Allan Kimble	Fisheries Technician	NWAFC-Seattle

Table 1. Starting position, depth, length of tow in nautical miles, and surface and bottom temperatures by tow number. Cruise AK-87-02.

HAUL NO.	STARTING POSITION LAT.	LONG.	DEPTH (FM)	NAUTICAL MILES TOWED	TEMP(°C) SURF.	BTTM.
1	55-12.47	161-50.19	54	1.50	10.3	6.1
2	55-14.32	161-46.63	59	1.28	9.9	6.0
3	55-16.48	161-36.71	60	1.23	10.8	5.8
4	55-17.73	161-35.48	55	1.30	10.8	5.9
5	55-17.36	161-40.99	56	1.17	11.0	5.9
6	55-13.13	161-59.63	36	0.71	9.9	7.4
7	55-12.73	161-50.67	50	0.67	10.4	6.0
8	55-17.29	161-45.27	62	0.70	10.6	6.0
9	55-20.65	161-40.93	76	0.58	10.7	6.2
10	55-20.28	161-35.40	53	0.70	12.6	6.1
11	55-34.22	161-18.24	35	0.60	12.2	7.9
12	55-27.44	161-37.84	51	0.78	11.9	7.0
13	55-26.37	161-36.57	44	0.54	11.1	6.7

Table 2. Total catch in pounds by tow for pandalid shrimp, pink shrimp, and fish. Counts per pound for pink shrimp by tow.

HAUL NO.	TOTAL PANDALIDS	TOTAL PINK SHRIMP	TOTAL FISH	PINK SHRIMP COUNT PER POUND
1	36.6	36.5	1357.3	97
2	30.2	30.2	1921.0	99
3	149.3	149.0	1845.1	108
4	50.9	50.8	2154.1	96
5	39.1	39.0	2453.5	121
6	1.4	1.3	668.8	181
7	8.8	8.8	994.1	84
8	65.8	65.6	1209.3	97
9	32.7	32.4	1310.0	114
10	3.1	3.0	911.0	---[1]
11	249.1[2]	2.2	575.9	---[1]
12	4.0	3.7	950.3	108
13	0.4	0.3	589.0	57
Average	51.65	32.52	1303.0	105

1 Pink shrimp from hauls 10-11 were not measured or weighed.
2 Catch from Canoe Bay (haul 11) not used for biomass estimates.

Table 3. Biomass estimates of total pandalid and pink (Pandalus borealis) shrimp in Pavlof Bay 1972-1987. Values given in millions of pounds with 80% confidence interval.

YEAR	PANDALIDS	PINKS
1972	44.81 (37.68-51.93)	18.32 (15.43-21.20)
1973	21.29 (12,64-29.93)	6.80 (6.75-6.85)
1974	49.67 (40.83-58.51)	25.30 (22.94-27.66)
1975	42.88 (32.67-53.08)	15.18 (12.34-18.02)
1976	52.64 (46.91-58.38)	23.80 (20.03-27.56)
1977	53.17 (48.19-58.15)	27.32 (20.86-33.77)
1978	11.81 (9.72-13.89)	7.94 (6.35-9.53)
1979	1.35 (0.79-1.91)	1.32 (0.81-1.83)
1980	1.29 (0.89-1.69)	1.21 (0.83-1.59)
1981	1.50 (1.09-1.90)	1.46 (1.07-1.85)
1982	0.34 (0.22-0.46)	0.34 (0.22-0.46)
1983	1.23 (0.98-1.48)	1.20 (0.95-1.45)
1984	0.15 (0.08-0.21)	0.14 (0.08-0.21)
1985	0.28 (0.18-0.38)	0.28 (0.18-0.38)
1986	1.10 (0.79-1.42)	1.05 (0.74-1.37)
1987	0.63 (0.33-0.92)	0.63 (0.33-0.92)

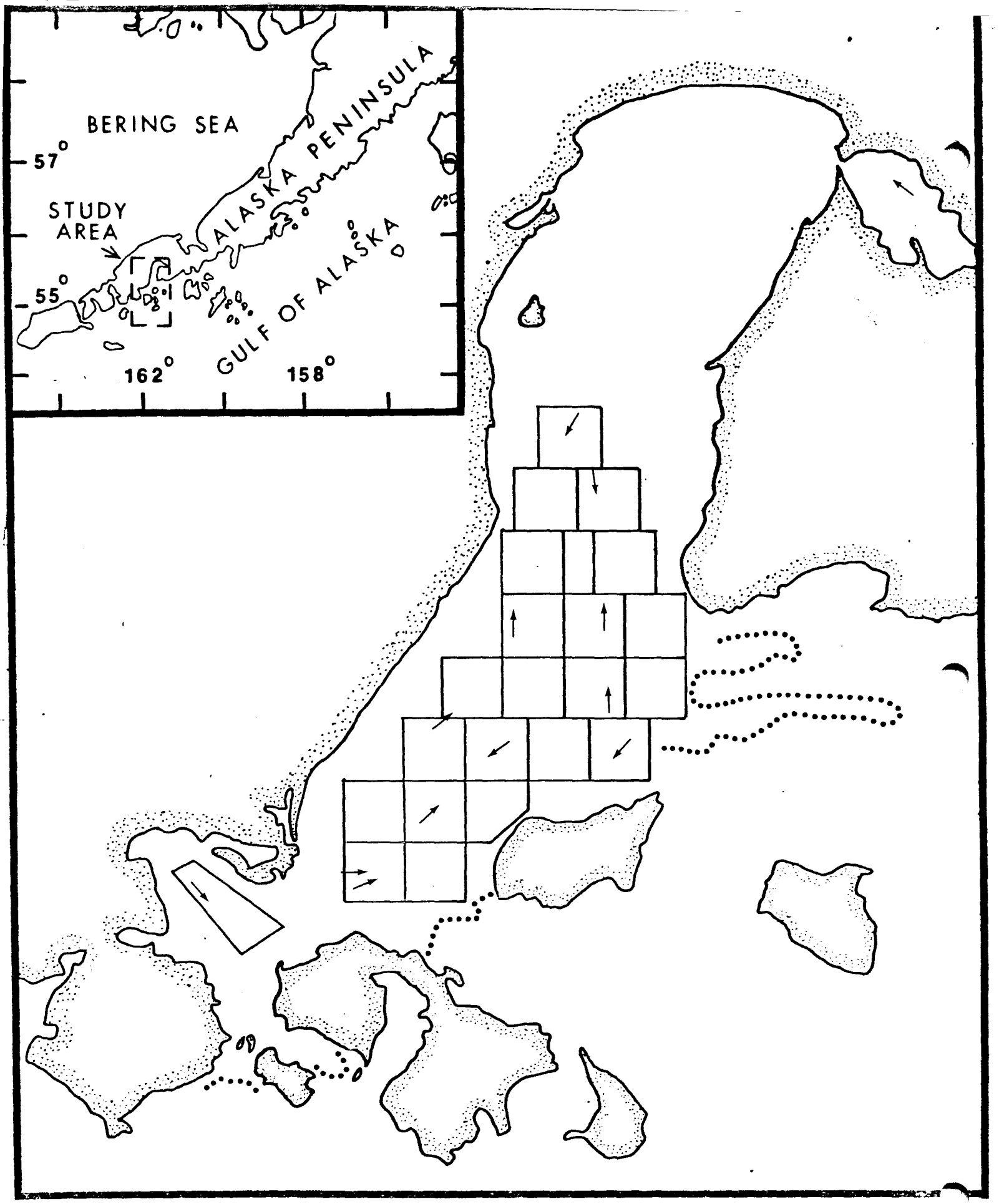

Figure 1. -- Survey tows completed within Pavlof Bay sampling grid and Canoe Bay during cruise AK-87-02 (leg 1).

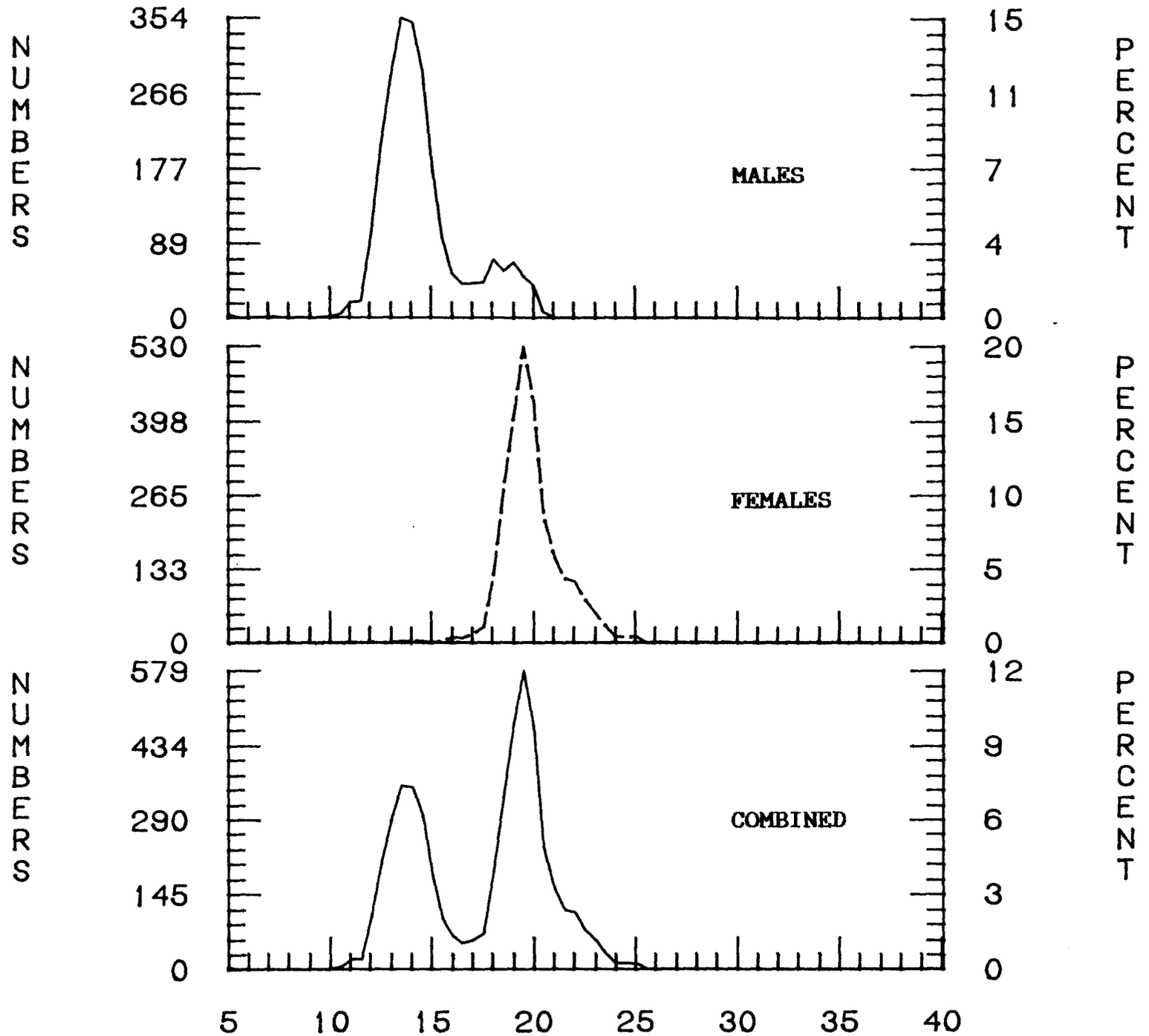

Figure 2. -- Sexed carapace length (mm) frequency distribution of Pink shrimp from Pavlof Bay. (Numbers per nautical mile towed)